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Record of Decision:

BYPASS 601 GROUND WATER CONTAMINATION
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BYPASS 601 GROUNDWATER CONTAMINATION SITE CABARRUS COUNTY, NORTH CAROLINA

RECORD OF DECISION
OPERABLE UNIT TWO

REGION IV
ATLANTA, GA

APRIL, 1993

DECLARATION
FOR THE
RECORD OF DECISION

SITE NAME AND LOCATION

Bypass 601 Groundwater Contamination Site
Concord, Cabarrus County, North Carolina

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Bypass 601 Groundwater Contamination Site in Concord, Cabarrus County, North Carolina, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the National Contingency Plan (NCP). This decision is based on the administrative record file for this Site.

The State of North Carolina concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This remedy addresses the principle threats posed by this Site. The major threat is the contaminated groundwater emanating from beneath the Site. This remedial action will also address the threat from soil contamination.

The major components of the selected remedy include:

GROUNDWATER

Extraction of groundwater across the Site that is contaminated above Maximum Contaminant Levels or the North Carolina Groundwater Standards, whichever are more protective;

Onsite treatment of extracted groundwater via precipitation and air stripping;

Discharge of treated groundwater to the POTW; and

Continued analytical monitoring for contaminants in groundwater.

SOIL/SEDIMENT

Demolition of portions of the abandoned flea market and any standing buildings at the MSR facility; Disposal at a municipal landfill;

Temporary relocation of an occupied trailer located on Source Area #3;

Excavation of onsite soils contaminated above the performance standards;

Onsite treatment of excavated soils via solidification/stabilization;

TCLP testing of solidified material;

Onsite disposal of solidified material; and

Backfilling, grading, and revegetation of excavated area and solidified material.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technology to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element. Since this remedy may result in hazardous substances remaining onsite above health based levels, a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

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Long-term Effectiveness and Permanence
Reduction of Toxicity, Mobility, or Volume
Short-term Effectiveness
Implementability
Cost

B. Soil Remediation
Overall Protection of Human Health/Environment
Compliance With ARARs
Long-term Effectiveness and Permanence
Reduction of Toxicity, Mobility, or Volume
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DECISION SUMMARY

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A. Introduction

The Bypass 601 Groundwater Contamination Site (Bypass 601 Site) is defined as an area located on the western edge of Concord, North Carolina, in which groundwater is contaminated by multiple sources (Figure 1-1). Previous investigations have indicated that the Martin Scrap Recycling (MSR) facility, which operated as a battery salvage and recycling facility from approximately 1966 to 1986, is one of the major sources of contamination. Ten other source areas of contamination related to battery disposal have been identified in the area (Figure 1-2).

B. Site Description

The MSR facility occupies approximately 13 acres of land and is currently inactive. The facility is bordered by US Highway 29/Route 601 on the west, a flea market and landfill to the north, to the east by Irish Buffalo Creek, and an unnamed tributary of the Irish Buffalo Creek to the south. Residences are located south and west of the MSR facility. The main facility contains several small buildings.

Source Area #1 is located adjacent to Unnamed Stream #1, west of Bypass 601. This area was comprised of one winding gully that contained cracked casings. The casings were deposited to a depth of 19 feet for a distance of approximately 500 feet in length and 30 feet in width. This area is located in a heavily wooded steep terrain behind an auto sales dealership.

Source Area #2 is located south of Montford Avenue and west of Bypass 601. This area was the previous site of the MSR facility and consists of surficial and buried battery casing debris. A mobile trailer is currently on this property along with various construction debris and buildings.

Source Area #3 is located at 72 Sumner Avenue. An occupied mobile trailer is currently on this property along with various construction debris. The visual extent of battery casing debris is approximately 8 feet by 8 feet.

Source Area #4 consists of the commercial property occupied by an abandoned flea market and is located north and adjacent to the MSR facility. An office building and an abandoned warehouse currently occupy this source area.

Source Area #5 is located at a private landfill along the eastern boundary of the MSR facility. This area is covered with miscellaneous construction debris, old rusted equipment, tanks, drums, vehicles, and other trash.

Source Area #6 is located behind a tire store on the corner of McGill and Bypass 601, and consists of two small piles of fill material containing battery casing debris along the western bank of Irish Buffalo Creek. The first pile is approximately 90 feet in length continuing south and extending up the steep grade bank approximately 15 feet. There is a break in the casings of approximately 45 feet, then a second pile begins and extends another 45 feet in length and 15 feet up the bank.

Source Area #7 is the radio tower site located approximately 1/4mile north of the MSR facility. The source area is bordered by Unnamed Stream #2 to the north and Irish Buffalo Creek to the east.

Source Area #8 consists of the floodplain area south of Unnamed Stream #1, presumably contaminated by surface water migration from the MSR facility.

Source Area #9 consists of an approximately 20 foot by 20 foot area adjacent to Unnamed Stream #1, approximately 200 feet west of Bypass 601. The source area is located south of Montford Avenue and lies southeast of Source Area #2. Cracked battery casings were found in this area.

Source Area #10 consists of an area where several piles of battery casing debris were both visible and buried. The area is adjacent to Unnamed Stream #2 and is bordered to the north,

west and south by Barnhardt Avenue, Groff Street, and Montford Avenue, respectively. The source area is located in a heavily wooded steep terrain.

C. Topography

The Bypass 601 Site is in the Piedmont Plateau, characterized by rolling hills cut by many streams, which usually originate in the mountains. Drainage in the Piedmont Plateau is generally to the southeast because of the general northwest-southeast orientation of the stream valleys, which are controlled by the underlying bedrock.

The original topography at the Bypass 601 Site has been altered significantly in past years due to filling and borrowing activities. The Site is topographically divided by Bypass 601.

The road bed in the vicinity of the Site has been artificially elevated by bringing in fill "bridge" between two hills, one of which was apparently later leveled for construction of the MSR facility.

D. Geology

There are two distinct lithostratigraphic units underlying the Site. They include a surficial unit comprised of unconsolidated soil and saprolite material, and an underlying granitic/ dioritic rock complex. The surficial unit consists primarily of residual soil derived from in situ chemical weathering of the underlying rock. Locally within stream basins, residual soil and/or rock have been chemically and mechanically eroded into alluvium. These alluvial deposits generally overlie the residuum along surface water features. In addition, there are localized zones of fill material which are part of the surficial unit.

Lithologic evaluations showed residual soils to be variable in composition ranging from sand to silt to clay. The dominant lithology is sandy clay. However, due to the interlayered nature of these sediments, zones of silty clay, clayey sand, and sand can pre-dominate. Sands are typically quartz and vary in grain size from fine to medium to coarse, and are subangular. Soil color ranged from gray to yellowish-brown to red to white.

Underlying the unconsolidated soil and saprolite material is consolidated granite and diorite rock. The granite is generally massive, with fracture frequency varying from 1 per 30 feet to 6 per 25 feet of rock cored, and averaged 1 per 10 feet. Fractures typically occurred at high angles. The color of the granite rock varied from white to grayish-green to gray with zones of white corresponding to veins of quartz.

E. Surface Water

The surface water features potentially affected by the Site include Irish Buffalo Creek, Unnamed Stream #1, and Unnamed Stream #2. These surface waters have been classified as Class C by the State, which is the basic water quality classification for all surface waters in the State of North Carolina, and protects freshwaters for secondary recreation, fishing, and aquatic life. Irish Buffalo Creek provides the eastern border for the Site and flows in a southeastward direction into the Rocky River. The Rocky River, located about seven miles south of the Site, is an eastern flowing tributary of the Pee Dee-Yadkin River. Both unnamed streams are intermittent streams which flow eastward through the middle of the Site into Irish Buffalo Creek. Irish Buffalo Creek is approximately 30 feet wide and 1.5 feet deep while the unnamed streams are approximately 5 feet wide and 0.5 feet deep at the Site under normal flow conditions.

F. Hydrogeology

Groundwater at the Bypass 601 Site generally occurs in two zones. The uppermost zone consists of the unconsolidated soil and saprolite material. This zone is referred to as the water table, shallow aquifer, and soil overburden zone. Water in this zone generally moves through the pore spaces of the overburden material as well as the relict fractures with the saprolite.

The second zone of groundwater occurrence is the bedrock zone where groundwater moves through fractures and secondary openings. The upper part of the bedrock zone is fairly well fractured. However, in general, the size and frequency of fractures decrease markedly with increasing

depth. Although the soil overburden and bedrock zones have often been referred to as different aquifers, they actually comprise one aquifer since the two zones are hydraulically connected.

Groundwater flow at the MSR facility is generally toward the confluence of Unnamed Stream #1 and Irish Buffalo Creek and is therefore intercepted by both these surface water pathways. Groundwater flow at Source Areas 1, 2, and 9 is intercepted by Unnamed Stream #1 on the western side of Bypass 601, while at Source Area #8, groundwater flow is intercepted by Unnamed Stream #1 on the eastern side of Bypass 601. Groundwater flow at Source Area #3 is intercepted by both Unnamed Stream #1 and Irish Buffalo Creek. Groundwater flow at Source Areas 4, 5, 6, and 7 is intercepted by Irish Buffalo Creek. Groundwater at source area 10 is intercepted by Unnamed Stream #2.

G. Meteorology

The climate is characterized by cool winters and warm summers. Temperatures fall as low as the freezing point on approximately one-half of the days in the winter months. Winter weather is changeable, with occasional cold periods, but extreme cold is rare. Snow is infrequent, with the first snowfall of the season usually appearing in late November or December. Heavy snowfalls have occurred, but any appreciable accumulation of snow on the ground for more than a day or two is rare.

Summers are long and quite warm, with afternoon temperatures frequently in the low 90s (F). The growing season is also long, the average length of the freeze-free period being 216 days.

Rainfall is generally evenly distributed throughout the year, the driest weather usually occurring in the fall. Summer rainfall comes principally from thunderstorms, with occasional dry spells of one to three weeks duration.

H. Demography and Land Use

The City of Concord is within a four-mile radius of the Site. Concord has an estimated population of 27,347. Current land use around the Site is primarily light industrial and commercial, with local residential neighborhoods. Industries include sand and gravel operations, private landfill operations, and manufacturing related to the textile industry.

Commercial operations include convenience food stores and gas stations, auto sales and repair, retail shopping centers, fast food restaurants, and mobile home sales operations. Residential neighborhoods are interspersed with the light industrial/commercial areas which line the main roads within a three-mile radius of the Site. It is estimated that more than 1,400 people reside within a three-mile radius of the Site. The population in the vicinity of the Site obtains its potable water supply from either public water supply wells or from private wells. No users are known to be currently withdrawing water from the creeks in the area. Irish Buffalo Creek is used for fishing and swimming.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Site History

The MSR facility dealt in the recovery of scrap metal, most notably lead, which was recovered from scrap vehicle batteries. The batteries were "cracked" by sawing off the tops with an electric saw. Lead plates were then removed from the batteries for reclamation. The waste from this operation consisted of the sulfuric acid (contaminated with lead) from the batteries, and battery casings. Initially, the waste acid was collected and disposed of in a surface impoundment on the MSR property. Since rainwater and surface runoff could enter the impoundment causing it to overflow, a subsurface drain composed of perforated plastic pipe, surrounded by gravel, was installed downgradient of the surface impoundment. This was done to provide a "leach field" to prevent overflow to Unnamed Stream #1, which was approximately 150 feet from the impoundment. In early 1982, MSR reportedly stopped using the surface impoundment and began collecting the waste acid in stainless steel holding tanks. The facility reportedly operated from 1966 to 1986.

The additional ten source areas were discovered during the remedial investigation for Operable Unit #1. Source Area #2 was also reported to be the site of a reclamation operation operated by

Mr. Martin before the facility moved to its present location.

B. Previous Investigations

From at least early 1975, several Site investigations were performed at the Bypass 601 Site. Sampling studies have been conducted by local, state, and federal agencies, as well as a consultant for MSR. These sampling studies, however, have been primarily limited to the MSR facility.

Most recently, an RI/FS at the Site, completed in 1990, identified metal contamination of soils throughout the MSR facility. The volume of soils contaminated with lead in excess of 500 milligrams per kilogram (mg/kg), the established soil remediation level for lead, was estimated to be approximately 57,000 cubic yards. The 1990 RI results also indicated that the contaminated soils and buried battery casings are continuing to release contaminants to downgradient soils, surface water, stream sediments, and groundwater. In addition, several additional contaminant source areas were identified but not investigated. The additional areas would be the focus of a subsequent investigation.

C. Enforcement Activities

From 1981 through 1986, the MSR facility was inspected, cited and fined for various violations under the Occupational Safety and Health Administration (OSHA), and the Resource Conservation and Recovery Act (RCRA) by the North Carolina Department of Environmental Management (DEM) and the North Carolina Division of Health Services (DHS).

In October 1984, the Bypass 601 Site was proposed for inclusion on the National Priorities List (NPL) and finalized in June 1986.

EPA sent notice letters to the following companies and individuals in September 1985, for conduct of the OU #1 RI/FS, and in November 1990, for conduct of the OU #1 RD/RA:

1. Oliver Martin
2. Carrie Martin
3. Bill Martin, President, Martin Scrap Recycling, Inc.

The notice letters also informed the PRPs of their potential liability for past costs.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

Pursuant to CERCLA 113(K)(2)(B)(i-v) and 117, the RI/FS Report and the Proposed Plan for the Bypass 601 Site were released to the public for comment on December 17, 1992. These documents were made available to the public in the administrative record located in an information repository maintained at the EPA Docket Room in Region IV and at the Charles A. Cannon Memorial Library in Concord, North Carolina.

The notice of availability for these documents was published in the Concord Tribune Newspaper on December 17, 1992. A public comment period on the documents was held from December 17, 1992 to February 18, 1993. A copy of the notice was mailed to the public. In addition, a public meeting was held on January 7, 1993. At this meeting, representatives from EPA answered questions about problems at the site and the remedial alternatives under consideration. Meetings with city and county officials were also held.

Other community relations activities included:

- Issuance of a Fact Sheet on the RI/FS process in September 1991.
- Issuance of a Fact Sheet on the RI results in September 1992.
- Issuance of a Fact Sheet on the Proposed Plan in December 1992.

IV. SCOPE AND ROLE OF RESPONSE ACTION WITHIN SITE STRATEGY

As with many Superfund Sites, the Bypass 601 Site is very complex. As a result, the Site was

divided into units or phases, referred to as "operable units." The operable units (OUs) at this Site are:

OU One: Addressed soil contamination at the MSR facility (interim containment)

OU Two: Addresses soil contamination at other sources of contamination; and addresses groundwater contamination across the entire Site.

The ROD for the first OU was signed on August 31, 1990. The interim containment remedy was never implemented (See Section XII). The intent of the remedial action presented in this ROD is to reduce future risks at the entire Site by removing the threat posed by contamination.

The ROD for OU 2 amends the OU 1 ROD to include the excavation and final cleanup envisioned by the OU 1 ROD. In addition, the groundwater remedy proposed as OU 3 on December 17, 1992 is also described in this ROD as a part of OU 2.

This ROD will present a final remedial action for both operable units.

V. SUMMARY OF SITE CHARACTERISTICS

The RI at the Bypass 601 Site included the characterization of the following routes of contaminant migration: groundwater, surface water, soil and sediment contamination. In addition, a removal was conducted during the RI. Results of all activities are summarized below.

An onsite laboratory was used during the investigation to perform lead analysis of all the samples collected. The onsite laboratory provided quick turnaround results which guided the field investigation by quickly providing analytical data to indicate where further sampling should occur. The onsite laboratory provided EPA Data Quality Objective (DQO) Level 3 data.

A. Soil Investigation

Twenty percent of the samples sent to the onsite laboratory were split and sent to a Contract Laboratory Program (CLP) laboratory for complete Target Compound List/Target Analyte List (TCL/TAL) and sulfate analyses. Selection of the samples to be split and sent to the CLP laboratory were field determined, with the most heavily contaminated samples being analyzed to characterize and define the extent of soil contamination at EPA DQO Level 4.

A total of 211 surface soil and 240 subsurface soil samples were collected during the soil investigation from the ten source areas. In addition, background samples were collected from five locations to provide data concerning the local chemical quality of the surface and subsurface soil.

The background sample locations are shown in Figure 5-1. Two surface soil samples and three soil boring samples were collected in areas that appeared to be unaffected by Site operations.

Figures 5-2 through 5-11 show the soil sample locations for source areas 1 - 10. Lead was the predominant contaminant found, with higher concentrations and greater frequency of occurrence than any other contaminant. Other metals found include antimony, barium, cadmium, copper, vanadium, zinc, and manganese. In addition, to a smaller extent, semi-volatile organic compounds such as phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(b&/or k) fluoranthene were also found.

Contamination was not found in Source Area #7. In addition, no sign of battery casing debris or any other wastes or soil contamination could be visually identified in this Source Area.

Average background concentrations and maximum concentrations found for the contaminants of concern are shown in Table 8-1.

B. 1992 Immediate Removal

During the remedial investigation, four of the Source Areas (1,2,9, 10) were found to present an immediate risk to human health. These areas were visually contaminated with battery casing debris. The areas also were easily accessible to the public. Toxicity Characteristic Leaching

Procedure (TCLP) tests results indicated lead at 15 ppm, three times the regulatory limit of 5 ppm.

Battery casing debris and lead contaminated soil were removed from the four areas and transmitted to the MSR facility. A total of 9,587.3 tons or 14,075 cubic yards of material were stockpiled at the MSR facility and covered with a 20 mil liner. Two tin-roofed structures and a portion of a building were demolished to make room for the stockpile. Portions of the removal were performed during and after the RI sampling.

C. Groundwater Investigation

Groundwater sampling was conducted at the Site to fully assess the types and concentrations of contaminants present in the aquifer system, and to determine the extent and magnitude of groundwater contamination with regard to each of the Source Areas.

A total of 38 monitor wells (16 two-well clusters and 6 single wells) were installed at the Site to supplement the 20 existing monitor wells (10 two-well clusters) installed during the 1990 RI (Figure 5-12). All samples were sent to a CLP laboratory for TCL/TAL and sulfate analyses.

Most of the metal contamination in groundwater appears to be associated with buried battery casing debris at the MSR facility, and Source Areas 1,2,3,4,5, and 10. In addition, the metals contamination appears to be limited mainly to the upper 30 feet of the aquifer. Concentrations of lead ranged from not detected (ND) to 2500 micrograms per liter (ug/l). Other metals found include barium, beryllium, cadmium, chromium, copper, nickel, vanadium, zinc, and manganese.

Volatile organic compounds (VOC), 1,2-dichloroethane, carbon tetrachloride and benzene, were found in groundwater in Source Areas 4 and 5 and the MSR facility. The VOC contamination was also limited to the upper 30 feet of the aquifer. The concentration of 1,2-dichloroethane ranged from ND to 69 ug/l.

Sulfate contamination appears to be limited mainly to the MSR facility and Source Area #2, which are the two areas of the Site where battery cracking operations are reported to have taken place in the past. The sulfate contamination appears to have moved into the deeper part of the aquifer.

D. Well Survey/Private Well Sampling Investigation

Two water use surveys have been conducted within a one-mile radius around the Site within the last three years. Those residences which rely on private wells for their source of potable water are shown in Figure 5-13. Most of the private wells are believed to be constructed to obtain water from the bedrock zone of the unconfined aquifer. The average well depth is approximately 186 feet below land surface, with an average yield of approximately 23 gallons per minute.

Twelve private well were sampled during this investigation (Figure 5-14). Three of the private wells sampled (PW-01, PW-02, and PW-05) contained elevated levels of lead. These wells were later resampled and lead levels were found to be below health concerns.

E. Surface Water/Sediment Investigation

Samples of surface water and bottom sediments were collected both onsite and offsite to determine and evaluate surface water contaminant migration pathways and the extent and magnitude of surface water contamination with regard to each of the source areas identified at the site. In addition, shallow cores were collected from the stream sediments to determine the vertical extent of sediment contamination. The sampling locations are shown in Figure 5-15.

Samples were collected from six locations on Irish Buffalo Creek, and five locations each from Unnamed Streams #1 and #2. All surface water and 20% of sediment samples were sent to a CLP laboratory for TCL/TAL and sulfate analyses.

Lead, copper, and zinc were detected in the surface water samples. The concentration of lead ranged from ND to 36 ug/l. The metals detected in surface water appear to be associated with the MSR facility and Source Area #10.

In sediments, lead was the only metal detected in any significant concentration. The lead was detected in sediments downstream from the MSR facility and ranged in concentration from 48 to 69 milligrams per kilogram (mg/kg).

F. Ecological Investigation

A preliminary ecological sampling was conducted at the Site. It included benthic macroinvertebrate collection and identification, and fish whole body tissue sampling and analysis. This sampling was conducted to determine if the Site might have impaired the structure and function of the biological communities in the streams draining the Site. Benthic macroinvertebrates have limited migration patterns and therefore are good indicators of localized conditions and aid in the impact assessment of Site related contamination.

The benthic macroinvertebrate samples were collected at three locations in Irish Buffalo Creek and three locations in Unnamed Stream #1. Nine fish whole body tissue samples were collected from Irish Buffalo Creek and analyzed for lead (Figure 5-16).

The diversity result appear to show that stations 2 and 3 were the most impacted relative to station 1 (reference), while the equitability results show that stations 2, 3, and 5 were the most impacted. The relative abundance of chironomids, a pollution tolerant organism, shows that stations 2, 3, and 6 were the most impacted. These results suggest an impact to the aquatic communities of the streams located directly adjacent to the Site.

Low levels of lead were detected in predator level samples collected from all three locations, including the reference station 1. These results suggest that contamination from the Site is not impacting the fish communities in the adjacent streams.

VI. SUMMARY OF SITE RISKS

The Bypass 601 Site is releasing contaminants into the environment. The Baseline Risk Assessment Report presents the results of a comprehensive risk assessment that addresses the potential threats to public health and the environment posed by the Site under current and future conditions, assuming that no remedial actions take place, and that no restrictions are placed on future use of the Site.

The Baseline Risk Assessment Report consists of the following sections: identification of chemicals of potential concern; toxicity assessment; human exposure assessment, risk characterization; and environmental assessment. All sections are summarized below.

A. Contaminants of Concern

Data collected during the RI were reviewed and evaluated to determine the contaminants of concern at the Site which are most likely to pose risks to the public health. These contaminants were chosen for each environmental media sampled.

Once these contaminants of concern were identified, exposure concentrations in each media were estimated. Exposure point concentrations were calculated for groundwater and surface soils using the lesser of the 95 percent upper confidence limit concentration or the maximum detected value as the reasonable maximum exposure (RME) point concentration. Exposure point concentrations for groundwater are shown in Table 6-1. Exposure point concentrations for each source area are presented in Table 6-2.

B. Exposure Assessment

The exposure assessment evaluates and identifies complete pathways of exposure to human population on or near the Site. Current exposure scenarios include exposure through incidental ingestion of soil; inhalation of fugitive dusts from soils; dermal contact with soils; and ingestion of water from private wells. Land use assumptions include residential, commercial/industrial and child visitor scenario.

Future use scenarios consider construction of a water supply well within the groundwater contaminant plume and ingestion of soil, inhalation of dusts and dermal contact with soils in Source Areas 4 and 5, which are currently used for commercial/industrial purposes, as a

worse-case scenario. Possible exposure scenarios for groundwater include exposure to contaminants of concern from the groundwater plume in drinking water and through inhalation of volatiles evolved from water through household water use. Table 6-3 shows the exposure assumptions used to determine the risk at this Site. Further detail and mathematical calculations can be reviewed in the Baseline Risk Assessment.

C. Toxicity Assessment

Under current EPA guidelines, the likelihood of adverse effects occurring in humans from carcinogens and noncarcinogens are considered separately. These are discussed below. Tables 6-4 and 6-5 summarize the carcinogenic and noncarcinogenic toxicity criteria for the contaminants of concern.

Cancer slope factors have been developed by EPA for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. Slope factors, which are expressed in units of (kg-day/mg), are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upperbound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upperbound" reflects the conservative estimate of the risks calculated from the slope factor. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal -to-human extrapolation and uncertainty factors have been applied.

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied. These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse noncarcinogenic effects to occur.

In the case of lead, EPA recommends the use of the Agency's Uptake Biokinetic model which predicts blood-lead levels for children ages 0.5-7 under various exposure scenarios and lead concentrations.

D. Risk Characterization

The risk characterization step of the Site risk assessment process integrates the toxicity and exposure assessments into quantitative and qualitative expressions of risk. The output of this process is a characterization of the Site-related potential noncarcinogenic and carcinogenic health effects.

Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ), or the ratio or the estimated intake derived from the contaminant concentration in a given medium to the contaminant's reference dose. By adding the HQs for all contaminants within a medium or across all media to which a given population may be reasonably exposed, the Hazard Index (HI) can be generated. Calculation of a HI in excess of unity indicates the potential for adverse health effects. Indices greater than one will be generated anytime intake for any of the chemicals of concern exceeds its Reference Dose (RfD). However, given a sufficient number of chemicals under consideration, it is also possible to generate a HI greater than one even if none of the individual chemical intakes exceeds their respective RfDs.

Carcinogenic risk is expressed as a probability of developing cancer as a result of lifetime exposure. Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. EPA's acceptable target range for carcinogenic risk is one-in-ten-thousand (1E-4) to one-in-one-million (1E-6).

Neither a cancer slope factor nor a reference dose is available for lead. Instead, blood lead concentrations have been accepted as the best measure of exposure to lead. The EPA has developed a biokinetic/uptake model to assess chronic and nonchronic exposures of children to lead. The uptake/biokinetic model estimates total lead uptake resulting from diet, inhalation, and ingestion of soil/dust, water, paint, and placental transport to the fetus.

The uptake/biokinetic model calculates the uptake and blood lead levels for the most sensitive population, children ages 0 to 6 years old. EPA uses a blood lead level of 10 micrograms per deciliter (ug/dl) as the benchmark to evaluate lead exposure.

Current Use

Cancer and noncancer risks for the current use scenario are summarized in Table 6-6. Noncancer health effects are considered possible for a child resident in Source Areas 1, 2, 8, 9, and 10. Noncancer health effects are not expected for Source Areas 3 and 6, nor for adult residents, child visitors, or adult workers. Estimates of cancer risk for a child resident range from 3.5E-6 in Source Area #2 to 1.1E-4 in Source Area #9. The highest estimate of cancer risk was for an adult resident (1.9E-4).

Projected blood lead levels exceed EPA's benchmark of 10 ug/dl for all age groups in Source Areas 2 and 9 and some age groups in Source Area #8, as shown in Table 6-7.

Future Use

Cancer and noncancer risks associated with the future use scenario are summarized in Table 6-8. As measured by hazard indices, noncancer health effects are considered possible due to ingestion of groundwater obtained from within the contaminant plume. Projected blood lead levels are given in Table 6-9. The levels exceed EPA's benchmark in all source areas.

Contaminant Risk

The quantified carcinogenic risk and non-carcinogenic hazard indices for each contaminant of concern is given in Table 6-10 for soil and Table 611 for groundwater.

E. Environmental Assessment

Several source areas contained contaminants in surface soil at concentrations which may be toxic to wildlife if ingested. However, due to several factors, including lack of food and water sources, lack of suitable cover and extensive human activity, wildlife are not attracted to these areas and are therefore not placed at risk. Included in this group are Source Areas 2, 4, and 5.

The remaining source areas are expected to support more diverse wildlife populations. Rodents may be exposed to contaminated soils through ingestion and direct contact. Transfer of contaminants up the food chain through predation on rodents by birds of prey or other carnivores is possible. The potential for adverse effects on such animals is difficult to measure, but would be expected to be small. The elevated concentrations of lead in surface water and sediment would be expected to affect fish and invertebrate communities at the Site. This assessment is consistent with the results of the benthic macroinvertebrate investigation, which concluded that an impact to the aquatic communities of the streams directly adjacent to the Site has occurred.

F. Conclusions

Actual or threatened releases of hazardous substances from this Site if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

VII. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

Section 121(d) of CERCLA, as amended by SARA, requires that remedial actions comply with requirements or standards set forth under Federal and State environmental laws. The requirements that must be complied with are those that are applicable or relevant and appropriate to the (1) potential remedial actions, (2) location, and (3) media-specific chemicals at the Site.

Applicable requirements are those requirements specific to the hazardous substance, location, and/or contemplated remedial action, that are, or will be, related to the Site. These requirements would have to be met under any circumstance. Relevant and appropriate requirements

are those requirements that address problems or situations sufficiently similar to those encountered at the Site, so that their use is well suited to the Site, but for which the jurisdictional prerequisites have not been met.

This Section examines the cleanup criteria associated with the contaminants found and the environmental media contaminated.

A. Action-Specific ARARs

Action-specific ARARs are technology-based, establishing performance, design, or other similar action-specific controls or regulations on activities related to the management of hazardous substances or pollutants. Potential action-specific ARARs are presented in Table 7-1.

B. Location-Specific ARARs

Location-specific ARARs are design requirements or activity restrictions based on the geographical or physical positions of the Site and its surrounding area. Potential location-specific ARARs are presented in Table 7-2.

Federal classification guidelines for groundwater are as follows:

- Class I: Groundwater that is irreplaceable with no alternative source or is ecologically vital;

- Class II: A - Groundwater currently used for drinking water;

  B - Groundwater potentially available for drinking water;

- Class III: Groundwater not considered a potential source of drinking water due to natural contamination or insufficient yield.

The aquifer at the Site is considered Class IIA. State classification guidelines are based on best usage (NCAC 2L.0201). The aquifer is therefore considered Class GA groundwater under the State system.

C. Chemical-Specific ARARs

Chemical-specific ARARs include those laws and regulations governing the release of materials possessing certain chemical or physical characteristics, or containing specified chemical compounds. These requirements generally set health or risk-based concentration limits or discharge limitations in various environmental media for specific hazardous substances, contaminants, and pollutants. Potential chemical-specific ARARs are listed in Table 7-3.

VIII. REMEDIAL ACTION OBJECTIVES

Based on the results of the RI and the baseline risk assessment, the Bypass 601 Site is comprised of two contaminated media. One contaminated medium consists of a combination of soil, battery casings, and sediment, which are combined into one group because they are closely linked in terms of removal and treatment options. Groundwater is the other contaminated medium.

A. Soil/Sediment

Remediation levels for soil/sediment were developed to meet the following objectives:

- Prevent direct contact exposure to soil and sediment that contain levels of contaminants in excess of the remediation levels;

- Prevent migration of contaminants from the soil to groundwater;

- Prevent migration of contaminants from the soil or sediment to a surface water body; and

- Control future releases of contaminants to ensure protection of human health and the environment.

Table 8-1 presents the remediation levels for soil/sediment based on the health-based risk goals, values determined for "protection of groundwater", and contract required quantitation limits (CRQL). Maximum concentrations detected as well as average background concentrations are also included.

The final soil remediation levels are presented in Table 8-2. The remediation level was selected as the most conservative of the levels presented in Table 8-1. However, the average background concentration was selected as the remediation level if it exceeded the risk-based goal. In addition, Source Areas 4, 5, and the MSR facility were considered commercial/ industrial because the probability of these areas becoming residential is low. All other areas were considered residential or future residential.

The areal extent of soil contamination above the remediation levels presented in Table 8-2 is presented in Figures 8-1 through 8-8. Source Areas 1,7, and 10 do not contain any contaminants above the remediation levels presented in Table 8-2. Figure 8-9 shows the areal extent of sediment contamination. The estimated volume of soil/sediment exceeding remediation levels is presented in Table 8-3.

B. Groundwater

The chemical specific ARARs, along with the maximum concentrations detected are presented in Table 8-4. The groundwater remediation levels are presented in Table 8-5, and represent the most conservative level. The estimated total extent of groundwater is shown in Figure 8-10 and Figure 8-11. The vertical extent of metals and VOC contamination is assumed to extend through the upper 30 feet of the surficial aquifer. However, sulfate contamination is assumed to extend throughout 60 feet of the surficial aquifer.

C. Surface Water

The Federal and State ambient water quality criteria (AWQC), along with the range of detection for the contaminants of concern in surface water are presented in Table 8-6. The surface water is not included as a medium of concern due to the fact that if groundwater feeding the surface water in the area is remediated, and contaminated sediments and surficial soil contamination are removed, surface water will be remediated. This approach is based on remediation of the source. Surface water quality would be monitored to determine the effectiveness of source remediation.

IX. DESCRIPTION OF ALTERNATIVES

Tables 9-1 and 9-2 summarize the technologies considered for remediating the groundwater and soil contamination, respectively, at the Bypass 601 Site. These tables also provide the rationale as to why certain technologies were not retained for further consideration after the initial screening.

A. Remedial Alternatives to Address Groundwater Contamination

The following alternatives were developed to address groundwater contamination at the Site:

Alternative 1: No Action

Alternative 2: Limited Action

Alternative 3: Primary Source Area Pumping/Onsite Treatment
A. Discharge to Surface Water
B. Discharge to POTW

Alternative 4: Complete GW Extraction/Onsite Treatment
A. Discharge to Surface Water
B. Discharge to POTW

The remedial response actions to address groundwater contamination are discussed below.

Alternative 1: No Action

This alternative provides the baseline case for comparing remedial actions for groundwater and the level of improvement achieved. The only actions included in this alternative are groundwater sampling and analysis of 30 wells, and a data review every 5 years for 30 years. All samples would be collected and analyzed for the metals of concern, sulfates, benzene, 1,2-dichloroethane, and carbon tetrachloride.

There are no capital costs associated with this alternative. Operating costs are based on the review of Site conditions every five years. There would be no maintenance costs.

Total Capital Costs	$0
Present Worth O & M Costs	$170,036
Total Present Worth Costs	$170,036

Alternative 2: Limited Action

This alternative is identical to the no action alternative described above except that it includes supplying an alternate source of drinking water (i.e., by connecting residents to the Cabarrus County potable water supply) to any residents onsite with contaminated wells, and implementation of institutional controls to control, limit, and monitor activities onsite.

Total Capital Costs	$ 16,250
Present Worth O & M Costs	$170,036
Total Present Worth Costs	$186,286

Alternative 3A: Primary Source Area Pumping/Onsite Treatment/Discharge to Surface Water

This alternative is identical to the limited action alternative described above, except that it includes groundwater extraction at the primary source areas (MSR facility, Source Areas 1, 2, 3, 4, 5, 9 and 10); sulfate removal using ion exchange, metals removal using precipitation; VOC removal using air stripping; and discharge of the treated effluent to Irish Buffalo Creek.

Groundwater monitoring on at least an annual basis will be required to evaluate remediation as it progresses so that timely adjustments can be made, if determined appropriate. A period of 30 years is assumed for complete remediation.

One treatment system located on the MSR facility will be constructed. Contaminated groundwater from the other source areas will be pumped to this central location. The treated effluent must meet the surface water discharge criteria. The groundwater system will be designed to operate 24 hours per day. System controls would allow for complete automatic operation with minimal operator attention. Alarms and switches would be furnished for fail-safe operation.

To the extent possible, major equipment would be furnished skidmounted and complete with all piping and controls mounted on structural steel support skids. For costing purposes, it is assumed that air quality control equipment would be needed to capture VOCs released from the air stripper and that the sludge produced from the metals precipitation process would be disposed of at a RCRA-approved hazardous waste landfill facility.

This alternative assumes that chromium is not present in its hexavalent state. If hexavalent chromium is detected during the RD phase, adjustments would need to be made to incorporate chromium reduction as a pretreatment step.

Total Capital Costs	$ 2,743,000
Present Worth O & M Costs	$ 7,284,145
Total Present Worth Costs	$10,027,145

Alternative 3B: Primary Source Area Pumping/Onsite Treatment Discharge to POTW

This alternative is identical to Alternative 3A except that instead of discharging the treated effluent to Irish Buffalo Creek, the treated effluent is discharged to the POTW. In addition, because the POTW will not require pre-treatment for sulfate, this alternative does not include sulfate removal using ion exchange.

Total Capital Costs	$ 2,018,250
Present Worth O & M Costs	$ 6,388,251
Total Present Worth Costs	$ 8,406,501

Alternative 4A: Complete Groundwater Pumping/Onsite Treatment Discharge to Surface Water

This alternative is identical to Alternative 3A except that it includes extraction of all contaminated groundwater, not just from the primary source areas. Therefore, in addition to the areas mentioned in Alternative 3A, groundwater would be recovered from Source Areas 7 and 8.

Total Capital Costs	$ 3,458,000
Present Worth O & M Costs	$ 7,284,145
Total Present Worth Costs	$10,742,145

Alternative 4B: Complete Groundwater Pumping/Onsite Treatment Discharge to POTW

This alternative is identical to Alternative 4A except that instead of discharging the treated effluent to surface water, the treated effluent is discharged to the POTW. In addition, because the POTW will not require pre-treatment for sulfate, this alternative does not include sulfate removal using ion exchange.

Total Capital Costs	$ 2,782,000
Present Worth O & M Costs	$ 7,039,522
Total Present Worth Costs	$ 9,821,522

B. Remedial Alternatives to Address Soil Contamination

The following alternatives were developed to address soil/sediment contamination at the Site:

Alternative 1: No Action

Alternative 2: Limited Action

Alternative 3: Excavation/Onsite Disposal/Capping

Alternative 4: Excavation/Onsite Treatment by Soil Washing, Thermal Desorption and Solidification/Stabilization/Onsite Disposal

Alternative 5: Excavation/Onsite Treatment by Thermal Desorption and Solidification/Stabilization, Onsite Disposal

Alternative 6: Excavation and Offsite Disposal

Alternative 7: Excavation/Onsite Treatment by Solidification/Stabilization Onsite Disposal

Alternative 8: Excavation/Onsite Treatment by Solidification/Stabilization/Offsite Disposal

The remedial response actions to address soil/sediment contamination are discussed below.

Alternative 1: No Action

This alternative provides the baseline case for comparing remedial actions and the level of improvement achieved. This alternative consists of leaving the source areas and the MSR facility as they are without conducting any further remedial actions. The only actions included in this alternative are groundwater sampling and analysis of 30 wells, and a data review every 5 years for 30 years.

All samples would be collected and analyzed for the metals of concern, sulfates, benzene, 1,2-dichloroethane, and carbon tetrachloride. Groundwater concentrations exceeding remediation levels would indicate that soil contamination still exists.

There are no capital costs associated with this alternative. Operating costs are based on the review of Site conditions every five years. There would be no maintenance costs.

Total Capital Costs	$0
Present Worth O & M Costs	$170,036
Total Present Worth Costs	$170,036

Alternative 2: Limited Action

This alternative consists of leaving the source areas and the MSR facility as they are without conducting any further remedial actions. However, deed restrictions and Site fencing would be implemented along with 5year reviews of the site, which consist of one round of groundwater sampling of 30 wells, over an estimated 30-year period.

Total Capital Costs	$133,250
Present Worth O & M Costs	$218,075
Total Present Worth Costs	$351,325

Alternative 3: Excavation and Onsite Disposal/Capping

This alternative involves excavating contaminated soil from all source areas and contaminated sediment from stream locations. Excavated or dredged soil/sediment would be transported to the MSR facility and spread over the surface where the majority of soil contamination occurs. At the same time, the existing stockpile at the facility (result of EPA emergency response action) would also be graded over the facility area. A multimedia cap would be constructed over the consolidated materials in accordance with RCRA guidelines to prevent rainfall infiltration and future leaching into the groundwater. Clean backfill would be applied to excavated areas, if necessary.

Depending on moisture content, soil/sediment would be dewatered to provide adequate structural stability for the cap at the MSR facility. The cap would be placed on approximately 3.2 acres of the MSR facility. Applying excavated soil/sediment over this surface area and grading the existing stockpile adds an approximate average of 15 feet in depth. A 2-foot thick clay layer, with a hydraulic conductivity less than 1 x 10[-7] cm/s would be placed over the existing soil to provide a foundation to support the surface cap. An impermeable membrane (40 mil HDPE liner) would be placed over the cover material and underlain by a geotextile fabric to protect the liner from puncture. A 1-foot drainage layer above the liner would be constructed of sand. The top 1-foot of the cap would consist of topsoil to provide a root zone for vegetative growth. In order to inhibit the clogging of the sand drainage layer, a filter fabric would be placed between the sand layer and the top soil. The fabric provides a barrier to soil particles sifting into the sand lens. The topsoil would be vegetated to prevent erosion. The cap would have a minimum slope of 2 percent. Surface runoff would be directed through appropriate drainage channels. Precipitation that percolates through the topsoil would flow laterally through the sand drainage layer and in to the drainage channels.

As part of Site preparation, the abandoned flea market at Source Area #4 and any standing buildings at the MSR facility would be demolished and disposed of offsite to make necessary space available for the cap. To be conservative, the structures are considered to be contaminated for disposal cost purposes. There would also be a relocation of one trailer home at Source Area #3.

Approximately one year would be required for the design and for contractor selection. Site preparation, construction of the multimedia cap, and excavation of contaminated soil/sediment is expected to require approximately one year. Therefore, assuming that weather conditions do not cause extreme delays, this alternative could be implemented in approximately two years.

Institutional controls consisting of access and use restrictions to protect the integrity of the cap system, and long-term groundwater monitoring, would apply. As required by SARA, five year reviews of the Site over an estimated 30-year period, would be conducted.

Total Capital Costs	$11,963,727
Present Worth O & M Costs	$ 792,620
Total Present Worth Costs	$12,756,347

Alternative 4: Excavation and Onsite Treatment by Soil Washing, Thermal Desorption, and Solidification/Stabilization, with Onsite Disposal

This alternative consists of excavating contaminated soil/sediment from all of the source areas, consolidating/staging the material in a central location (MSR facility), performing onsite treatment, and onsite backfilling with the treated material. For the purposes of the detailed analysis, it is assumed that soil washing is the main treatment; with a combination of thermal desorption and/or S/S to be used as post-treatment, if necessary. The final treatment scheme would depend upon the outcome of treatability testing and would be determined during the remedial design phase.

Preprocessing requirements would include screening to eliminate debris larger than 3 inches. The large volume of battery casing debris would be shredded to smaller than 1 inch in diameter. Approximately 18,511 cubic yards of debris will be mixed with calcium oxide to neutralize any remaining acid and/or lead, then stabilized. Soil/sediment washing would involve onsite treatment of contaminated soil and sediment with water and detergents and/or surfactants. With this alternative, approximately 79,908 cubic yards of soil/sediment exceeding remediation levels would be excavated and consolidated/staged at the MSR facility for treatment. Soil washing would be used as a volume reduction step. Because PAH cleanup criteria established for this site are low, thermal desorption of the washed soil/sediment still containing PAHs and carbon tetrachloride above remediation levels could be used as a post-treatment step. The volume of soil expected to be treated by thermal desorption is a maximum of 17,200 cubic yards. The offgases generated would be treated onsite by incineration or condensed and transported offsite.

The washed (and thermally processed, if required) soil/sediment that exceeds any of the cleanup criteria may be transported to an onsite cement batch plant where materials would be mixed with Portland cement and other aggregates. The fixed material must be subject to TCLP to determine if the treatment is effective. The fixed material would be replaced in onsite designated areas.

As part of Site preparation, the abandoned flea market at Source Area #4 and any standing buildings at the MSR facility would be demolished and disposed of offsite to make necessary space available for the cap. To be conservative, the structures are considered to be contaminated for disposal cost purposes. There would also be a relocation of one trailer home at Source Area #3.

The treatability study of the treatment technologies will require approximately six months and design of the treatment systems will require approximately six months. Approximately six months will be required for contractor selection. The actual implementation and treatment of all contaminated soil/sediment, including excavation, may take another two years. Therefore, assuming that weather conditions do not cause extreme delays, this alternative could be implemented in approximately 3.5 years.

Institutional controls consisting of access and use restrictions to protect the disposal area, and long-term groundwater monitoring, would apply. As required by SARA, five year reviews of the site over an estimated 30-year period, would be conducted.

Total Capital Costs	$55,224,415
Present Worth O & M Costs	$ 619,508
Total Present Worth Costs	$55,843,923

Alternative 5: Excavation and Onsite Treatment by Thermal Desorption, Solidification/Stabilization, Onsite Disposal

This alternative consists of excavating contaminated soil/sediment from all of the source areas, consolidating/staging the material in a central location (MSR facility), performing onsite treatment, and onsite backfilling with the treated material. For the purposes of the detailed analysis, it is assumed that S/S is the main treatment; with thermal desorption to be used as the pretreatment of PAH- and VOC-contaminated soils. The final treatment scheme would depend upon the outcome of treatability testing and would be determined during the remedial design phase.

Preprocessing requirements would include screening to eliminate debris larger than 3 inches. The large volume of battery casing debris would be shredded to smaller than 1 inch in diameter. Thermal desorption would involve onsite treatment of PAH- and VOC-contaminated soil and sediment at elevated temperatures. With this alternative, approximately 17,200 cubic yards of soil/sediment with concentrations above remediation levels would be excavated and

consolidated/staged at the MSR facility for thermal treatment. The offgases generated would be treated onsite by incineration or condensed and transported offsite.

The thermally processed soil/sediment that does not meet remediation levels and all metal-contaminated soil may be transported to an onsite cement batch plant where materials would be mixed with Portland cement and other aggregates. The fixed material must be subject to TCLP to determine if treatment is effective. The fixed material would be replaced in onsite designated areas. The volume of soil expected to be treated by S/S is a maximum of 78,230 cubic yards.

As part of Site preparation, the abandoned flea market at Source Area #4 and any standing buildings at the MSR facility would be demolished and disposed of offsite to make necessary space available for the onsite disposal of the treated material. To be conservative, the structures are considered to be contaminated for disposal cost purposes. There would also be a relocation of one trailer home at Source Area #3.

The treatability study of the treatment technologies will require approximately six months and design of the treatment systems will require approximately six months. Approximately six months will be required for contractor selection. The actual implementation and treatment of all contaminated soil/sediment, including excavation, may take another two years. Therefore, assuming that weather conditions do not cause extreme delays, this alternative could be implemented in approximately 3.5 years.

Institutional controls consisting of access and use restrictions to protect the disposal area, and long-term groundwater monitoring, would apply. As required by SARA, five year reviews of the Site over an estimated 30-year period, would be conducted.

Total Capital Costs	$33,233,920
Present Worth O & M Costs	$ 619,508
Total Present Worth Costs	$33,853,428

Alternative 6: Excavation and Offsite Disposal

This alternative involves excavating contaminated soil/sediment from all source areas and the MSR facility and loading and transporting it to an offsite RCRA-permitted (Subtitle C) landfill. An estimated 98,419 cubic yards of material would require transportation and disposal. All DOT and RCRA transportation requirements, including proper completion of a manifest, would be followed. Dump trucks, lined and covered, would be utilized for transport.

Once the contaminated material had been removed, the affected areas would be backfilled with clean fill to the original elevations, graded, and vegetated. Since Land Ban Restrictions would apply to the contaminated soil/sediment, pretreatment by the facility would be required prior to disposal.

As part of Site preparation, the abandoned flea market at Source Area #4 and any standing buildings at the MSR facility would be demolished and disposed of offsite to make necessary space available for the cap. To be conservative, the structures are considered to be contaminated for disposal cost purposes. There would also be a relocation of one trailer home at Source Area #3.

Approximately one year would be required for contractor selection and obtaining necessary permits for offsite disposal. Site preparation and excavation is expected to require approximately one year. Therefore, assuming that weather conditions do not cause extreme delays, this alternative could be implemented in approximately two years.

Total Capital Costs	$75,585,015
Present Worth O & M Costs	$ 345,880
Total Present Worth Costs	$75,930,895

Alternative 7: Excavation and Onsite Treatment by Solidification/Stabilization, Onsite Disposal

This alternative is the same as Alternative 5 above, except that thermal desorption of PAH- and VOC-contaminated soil is not included. S/S would be used to treat all contaminated material,

with onsite backfilling of the fixed material for final disposal.

In addition, the treated material would be placed on the flea market property (Source Area #4), the portion of the landfill identified as Source Area #5, as well as the MSR facility. The total area is approximately 8.6 acres. The height of the final disposal unit would be approximately 7 feet (treatment of 98,419 cubic yards).

However, since the S/S process could increase the volume of the treated material by a significant factor (10 to 100 percent), the height of the final unit could be as high as 14 feet.

Institutional controls consisting of access and use restrictions to protect the disposal area, and long-term groundwater monitoring, would apply. As required by SARA, five year reviews of the Site over an estimated 30-year period, would be conducted.

Total Capital Costs	$30,029,014
Present Worth O & M Costs	$ 619,508
Total Present Worth Costs	$30,648,522

Alternative 8: Excavation and Onsite Treatment by Solidification/Stabilization, Offsite Disposal

This alternative is the same as Alternative 7, except that the treated material will be disposed of offsite in an industrial landfill. Transportation by a licensed hauler would be arranged and all Department of Transportation (DOT) transportation requirements would be followed. It is conservatively assumed that 200,000 cubic yards of treated material would have to be disposed of at the facility, since the S/S process could increase the volume.

Total Capital Costs	$42,736,514
Present Worth O & M Costs	$ 587,604
Total Present Worth Costs	$43,324,117

X. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The remedial alternatives to address groundwater and soil/sediment contamination were evaluated using the nine evaluation criteria as set forth in the NCP, 40 CFR 300.430(e)(9). A brief description of each of the nine evaluation criteria is provided below.

THRESHOLD CRITERIA

1. Overall Protection of Human Health and the Environment addresses how an alternative as a whole will protect human health and the environment. This includes an assessment of how the public health and the environmental risks are properly eliminated, reduced, or controlled through treatment, engineering controls, or controls placed on the property to restrict access and (future) development. Deed restrictions are examples of controls to restrict development.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) addresses whether or not a remedy complies with all state and federal environmental and public health laws and requirements that apply or are relevant and appropriate to the conditions and cleanup options at a specific site. If an ARAR cannot be met, the analysis of the alternative must provide the grounds for invoking a statutory waiver.

PRIMARY BALANCING CRITERIA

3. Long-term Effectiveness and Permanence refers to the ability of an alternative to maintain reliable protection of human health and the environment over time once the cleanup levels have been met.

4. Reduction of Toxicity, Mobility, or Volume are the three principal measures of the overall performance of an alternative. The 1986 amendments to the Superfund statute emphasize that, whenever possible, EPA should select a remedy that uses a treatment process to permanently reduce the level of toxicity of contaminants at the site; the spread of contaminants away from the source of contaminants; and the volume, or amount, of contamination at the Site.

5. Short-term Effectiveness refers to the likelihood of adverse impacts on human health or the environment that may be posed during the construction and implementation of an alternative until cleanup levels are achieved.

6. Implementability refers to the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement the alternative.

7. Cost includes the capital (up-front) cost of implementing an alternative, as well as the cost of operating and maintaining the alternative over the long-term, and the net present worth of both the capital and operation and maintenance costs.

MODIFYING CRITERIA

8. State Acceptance addresses whether, based on its review of the RI/FS and Proposed Plan, the State concurs with, opposes, or has no comments on the alternative EPA is proposing as the remedy for the Site.

9. Community Acceptance addresses whether the public concurs with EPA's proposed plan. Community acceptance of this proposed plan will be evaluated based on comments received at the public meetings and during the public comment period.

These evaluation criteria relate directly to requirements in Section 121 of CERCLA, 42 USC Section 9621, which determine the overall feasibility and acceptability of the remedy. Threshold criteria must be satisfied in order for a remedy to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs between remedies. State and community acceptance are modifying criteria formally taken into account after public comment is received on the proposed plan. Table 10-1 provides a summary of all the alternatives along with the total present worth costs. The evaluation of the potential remedial alternatives to address soil and groundwater were developed as follows.

A. Groundwater Remediation

The following alternatives were subjected to detailed analysis for groundwater remediation:

Alternative 1: No Action

TABLE 10-1
REMEDIAL ALTERNATIVES

GROUNDWATER ALTERNATIVES		
Alternative 1	No Action	$ 170,036
Alternative 2	Limited Action	$ 186,286
Alternative 3	Pumping of Primary Source Areas/Onsite Treatment	
	A. Discharge to SW	$10,027,145
	B. Discharge to POTW	$ 8,406,501
Alternative 4	Complete GW Pumping/ Onsite Treatment	
	A. Discharge to SW	$10,742,145
	B. Discharge to POTW	$ 9,821,522
SOIL ALTERNATIVES		
Alternative 1	No Action	$ 170,036
Alternative 2	Limited Action	$ 351,325
Alternative 3	Excavation/Capping	$12,756,347
Alternative 4	Excavation/Onsite Treatment Soil Washing, Thermal Desorption, S/S, Onsite Disposal	$55,843,923
Alternative 5	Excavation/Onsite Treatment Thermal Desorption, S/S, Onsite Disposal	$33,853,428
Alternative 6	Excavation/Offsite Disposal	$75,930,895
Alternative 7	Excavation/Onsite Treatment S/S, Onsite Disposal	$30,648,522
Alternative 8	Excavation/Onsite Treatment S/S, Offsite Disposal	$43,324,117

Alternative 2: Limited Action

Alternative 3A: Primary Source Area Pumping/Onsite Treatment Discharge to Surface Water

Alternative 3B: Primary Source Area Pumping/Onsite Treatment Discharge to POTW

Alternative 4A: Complete Groundwater Pumping/Onsite TreatmentDischarge to Surface Water

Alternative 4B: Complete Groundwater Pumping/Onsite Treatment Discharge to POTW

Overall Protection of Human Health and the Environment

Each alternative was evaluated to determine whether it is likely to effectively mitigate and minimize the long-term risk of harm to public health and the environment currently presented at the Site. Alternative 1 does not eliminate any exposure pathways or reduce the level of risk. Alternative 2 eliminates some exposure pathways, with a reduction in the potential risk of groundwater ingestion and inhalation. The exposure pathways associated with continued contaminant migration in groundwater and through surface water discharge would not be eliminated. Alternatives 3 and 4 eliminate exposure pathways and it is expected that any potential risk of ingestion or inhalation would also be greatly reduced as long as the system is in operation.

Compliance With ARARs

The no action and the limited action alternatives would not comply with ARARs. Alternative 3 would attain ARARs in the primary source areas, while Alternative 4 would attain ARARs across the entire Site. Table 10-2 identifies the federal regulations applicable to the alternatives and Table 10-3 identifies the North Carolina regulations pertaining to these alternatives.

Long-term Effectiveness and Permanence

In Alternatives 1 and 2, contaminant migration through groundwater and surface water discharge would continue. In Alternative 3, the pathway exposure is moderately reduced. It reduces contamination and reduces potential for further migration from the primary source areas. Contaminated groundwater outside of primary source areas will continue to migrate. For Alternative 4, there would be a maximum reduction in pathway exposure risk, and would eliminate further migration.

Reduction of Toxicity, Mobility, and Volume

Alternatives 1 and 2 would not reduce the toxicity, mobility, or volume (T/M/V) of the contaminants. Alternative 3 would cause a moderate reduction of T/M/V, with Alternative 4 providing the maximum reduction of T/M/V.

Short-term Effectiveness

All of the alternatives can be implemented without significant risks to the community or on-site workers and without adverse environmental impacts.

Implementability

In Alternative 2, implementability would depend upon the requirements necessary to connect affected residents to the Cabarrus County water supply. Alternative 3A and 4A would require a NPDES permit, while Alternatives 3B and 4B would require approval by the local POTW.

Cost

Total present worth costs for the groundwater alternatives are presented in Table 10-1.

B. Soil Remediation

The following alternatives were developed for Site soils and were subjected to detailed analysis:

Alternative 1: No Action

Alternative 2: Limited Action

Alternative 3: Excavation and Onsite Disposal (Capping)

Alternative 4: Excavation and Onsite Treatment (Soil Washing, Thermal Desorption, S/S), Onsite Disposal

Alternative 5: Excavation and Onsite Treatment (Thermal Desorption, S/S), Onsite Disposal

Alternative 6: Excavation and Offsite Disposal

Alternative 7: Excavation and Onsite Treatment (S/S), Onsite Disposal

Alternative 8: Excavation and Onsite Treatment (S/S), Offsite Disposal

Overall Protection of Human Health and the Environment

Alternatives 1 and 2 do not eliminate any exposure pathways or reduce the level of risk. Alternative 3 virtually eliminates the potential risk of direct contact and leaching into the groundwater. It minimizes the risk of further contamination to drinking water wells and reduces the risk of groundwater ingestion and inhalation. Alternatives 4 through 8 eliminate the potential risk of direct contact and leaching into the groundwater.

Compliance With ARARs

Alternatives 6 and 8 would comply with EPA's offsite policy and Land Disposal Restrictions. Alternatives 4 through 8 would comply with all treatment ARARs, including TCLP.

Long-term Effectiveness and Permanence

Alternatives 1 and 2 would not be effective in removing or limiting the migration of contaminants. Alternative 3 would be effective at least 20 years, with proper maintenance of the cap, but it is not considered a permanent remedy. Alternatives 4, 5, and 7 are considered permanent remedies that would be effective. Alternatives 6 and 8 are permanent remedies for the Bypass 601 Site, but not at the offsite disposal facility.

Reduction of Toxicity, Mobility, and Volume

Contaminant levels would remain unchanged for Alternatives 1 and 2. Alternative 3 would eliminate the mobility and effective toxicity of the contaminants, but would not reduce the volume. Alternative 4 would reduce the T/M/V of the contaminants. Alternatives 5 through 8 would reduce the toxicity and mobility of the contaminants, but volume of contaminated material would increase due to the addition of the solidifier.

Short-term Effectiveness

All of the Alternatives can be implemented without significant risks to onsite workers or the community. Aquatic biota would be disturbed during excavation and backfilling of stream sediments in Alternatives 3 through 8.

Implementability

Implementation of Alternatives 1, 2, 3, 6, 7, and 8 would pose no significant difficulties. Implementation of Alternatives 4 and 5 may depend on the availability of mobile thermal desorption equipment.

Cost

Total present worth costs for the soil remediation alternatives are presented in Table 10-1.

C. Modifying Criteria

State and community acceptance are modifying criteria that shall be considered in selecting the remedial action.

State Acceptance

The State of North Carolina concurs with the selected remedy.

Community Acceptance

A proposed plan fact sheet was released to the public on December 17, 1992. The proposed plan public meeting was held on January 7, 1993. The public comment period on the proposed plan was held from December 17, 1992 to February 18, 1993. The letters, comments, and questions asked during the January 7th meeting and received during the comment period are summarized in the attached Responsiveness Summary.

XI. THE SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the NCP, the detailed analysis of alternatives and public and state comments, EPA has selected both a source control and groundwater remedy for this Site. At the completion of this remedy, the risk associated with this Site has been calculated to be within the accepted risk range determined to be protective of human health and the environment. The total present worth of the selected remedies, Alternative 4B for groundwater ($9,821,522) and Alternative 7 for soil ($30,648,522), is estimated at $40,470,044. See Tables 11-1 and 11-2 for the detailed cost estimates of the two chosen alternatives.

A. Source Control

Source Control remediation will address the contaminated soils and materials at the Site. The source control remedy requires that the contaminated soils in Source Areas 2, 3, 4, 5, 6, 8, and 9 be excavated and transported to the MSR facility. Contaminated soils on the MSR facility will also be excavated. The excavated material will be treated using a solidification/stabilization (S/S) technology. Stabilization is a chemical reaction between one or more waste components which would immobilize, insolubilize, or otherwise render the waste components less hazardous. The purpose of solidification is to transform hazardous contaminants into a physical form which is more suitable for storage and reduces the water permeability into the waste (acts as a barrier between the waste particles and the environment). Treatability testing must address the effectiveness in immobilizing metals, possible leaching, and the increased weight and volume of the S/S material. Emphasis will be placed on optimizing leachate resistance rather than structural integrity.

The excavated material will be transferred to an onsite cement batch plant, and mixed with portland cement and/or other aggregates. The battery debris will be preprocessed by shredder (to less than 1 inch in diameter) and mixed with calcium oxide to neutralize any remaining sulfuric acid and lead.

Following excavation and removal of soils from Source Areas 2, 3, 6, 7, 8, and 9, clean fill will be placed in the excavated areas. The areas will then be graded and revegetated. The treated material will be placed onsite at the MSR facility, and portions of the flea market property (Source Area #4) and the landfill. The areas that contain the treated material will then be covered and vegetated.

As part of Site preparation, portions of the abandoned flea market at Source Area #4, and any standing buildings at the MSR facility would be demolished and disposed of offsite. During source area remedial activities, one trailer home at Source Area #3 will require temporary relocation.

A.1. Excavation Standards

Excavation shall continue until the remaining soil and material achieve the following maximum contaminant levels.

Hazard Index (HI) - Relates to non-cancer risks
1E-06 Risk Level - Probability for carcinogenic effects
NA - Not applicable - Risk from lead is not calculated using HI or risk level.

A.2. Treatment Standards

The treated material must be subjected to toxicity characteristic leaching procedure (TCLP) (55 FR 11798, March 29, 1990) to determine if treatment is effective. The treated material will not be disposed of onsite until it passes the TCLP test. The treatability study that will be conducted before remediation begins will ensure that the mix of cement and aggregates is

sufficient to effectively fix all the contaminants.

B. Groundwater Remediation

Groundwater remediation will address the contaminated groundwater at the Site. Groundwater remediation will include extraction of contaminated groundwater, treatment and final discharge to the Publicly Owned Treatment Works (POTW).

The treatment will consist of precipitation of metals and suspended solids, and air stripping to remove organics. The treatment system will be located on the MSR facility, with contaminated groundwater from the other source areas pumped to this central location.

The groundwater system will operate 24 hours per day. System controls will allow complete automatic operation with minimal operator attention. Long-term monitoring for cleanup verification purposes and to track contaminant plume migration will be required. The system is expected to operate 30 years; samples will be collected from 30 existing wells on a quarterly basis for the first 5 years, and on an annual basis for the following 25 years.

The groundwater treatment system will also require monitoring and maintenance. Monitoring of the treatment system will include periodic sampling of the influent and effluent from the treatment system and analysis in accordance with the POTW discharge permit requirements. Sludge produced from the precipitation process will be analyzed for total metals and by TCLP. If the sludge passes TCLP and the concentrations of metals are below soil remediation levels, the sludge will be deposited onsite. If the sludge does not pass the TCLP test and/or the concentrations of metals are above the soil remediation levels, the sludge will be disposed of in an approved hazardous waste landfill.

B.1. Extraction and Performance Standards

Groundwater will be extracted from the MSR facility, Source Areas 1,2,3,4,5,7,8,9, and 10. Location of extraction wells and pumping rates will be determined during the remedial design.

Final discharge will be to the local POTW. Discharge standards will be driven by the POTW requirements and will be defined during the development of the Remedial Design.

Groundwater shall be treated until the following maximum concentration levels are attained throughout the contaminant plume:

Hazard Index (HI) - Relates to non-cancer risks
1E-06 Risk Level - Probability for carcinogenic effects
NA - Not applicable. Risk from lead is not calculated using HI or risk level.

The goal of this remedial action is to restore the groundwater to its beneficial use, as defined in Section 6.0. Based on information obtained during the RI, and the analysis of all remedial alternatives, EPA and the State of North Carolina believe that the selected remedy may be able to achieve this goal.

Groundwater contamination may be especially persistent in the immediate vicinity of the contaminants' source, where concentrations are relatively high. The ability to achieve remediation levels at all points throughout the area of attainment, or plume, cannot be determined until the extraction system has been implemented, modified, as necessary, and plume response monitored over time.

If the selected remedy cannot meet the specified performance standards, at any or all of the monitoring points during implementation, the contingency measures and goals described in this section may replace the selected remedy and goals for these portions of the plume. Such contingency measures will, at a minimum, prevent further migration of the plume and include a combination of containment technologies and institutional controls. These measures are considered to be protective of human health and environment, and are technically practicable under the corresponding circumstances.

The selected remedy will include groundwater extraction for an estimated period of 30 years, during which time the system's performance will be carefully monitored on a regular basis and

adjusted as warranted by the performance data collected during operation. Modifications may include any or all of the following:

a) at individual wells where remediation levels have been attained, pumping may be discontinued;

b) alternating pumping at wells to eliminate stagnation points;

c) pulse pumping to allow aquifer equilibration and encourage adsorbed contaminants to partition into groundwater;

d) installation of additional extraction wells to facilitate or accelerate cleanup of the contaminant plume.

To ensure that cleanup continues to be maintained, the aquifer will be monitored at those wells where pumping has ceased on an occurrence of at least every 2 years following discontinuation of groundwater extraction.

If it is determined, on the basis of the preceding criteria and the system performance data, that certain portions of the aquifer cannot be restored to their beneficial use, all of the following measures involving longterm management may occur, for an indefinite period of time, as a modification of the existing system:

a) engineering controls such as physical barriers, or long-term gradient control provided by low level pumping, as contaminant measure;

b) chemical-specific ARARs may be waived for the cleanup of those portions of the aquifer based on the technical impracticability of achieving further contaminant reduction;

c) institutional controls may be provided/maintained to restrict access to those portions of the aquifer which remain above remediation levels;

d) continued monitoring of specified wells; and

e) periodic reevaluation of remedial technologies for groundwater restoration.

The decision to invoke any or all of these measures may be made during a periodic review of the remedial action, which will occur at 5 year intervals in accordance with CERCLA Section 121(c).

The remedial actions shall comply with all ARARs (See Sections VII and X).

The presence of residual contamination in the solidified/stabilized material and the presence of contaminants in the groundwater will require deed recordation/restriction to document their presence and could limit future use of the property. The extent of the property restrictions and limitations will be determined during the remedial design.

XII. AMENDMENT TO OPERABLE UNIT ONE RECORD OF DECISION

On August 27, 1990, the EPA Region IV Administrator signed a Record of Decision (ROD) for Operable Unit (OU) One. OU #1 consists of the contaminated soils on the MSR facility only. This Amendment is being provided in accordance with CERCLA 117(c) and the National Contingency Plan (NCP) 40 CFR 300.435(c)(2)(ii). The amendment will become part of the administrative record file (NCP 40 CFR 300.825(a)(2)) for OU One and OU Two, which is located at the Site repository. The repository is located at the Charles A. Cannon Memorial Library, 27 Union Street, Concord, North Carolina.

A. Rationale for Issuing the ROD Amendment

The remedy chosen for OU #1 consisted of excavation and consolidation of contaminated soil, covering the soil with 6 inches of clean fill, HDPE liner, 18 inches of drainage layer, and 6 inches of clean topsoil, and revegetation. This remedy was only considered an interim action to prevent human and environmental exposure to the contaminants, and to minimize the generation of contaminated leachate entering the groundwater. As stated in the August 1990 ROD, the remedy

would not prohibit future remedial actions at the Site, but would provide a level of protection until such time that a treatment and/or disposal remedy could be implemented.

This ROD for OU #2 includes a permanent treatment remedy for the OU #1 soils at the MSR facility as well as the soils on the ten other identified source areas. Combining the soils for OU #1 and OU #2 for treatment is cost effective and efficient.

The fundamental differences to the ROD for OU #1 are presented below.

Original Remedy	Modified Remedy
Capping of approximately 57,000 cy of contaminated soil.	Solidification/Stabilization of approximately 20,800 cy contamination soil.
Remediation level of 500 ppm for lead only.	Remediation levels for various metals. See Table 8-2.

B. Description of New Alternatives

The original selected remedy, onsite capping, and the amended remedy, S/S, along with other alternatives evaluated in the FS are described in Section 9 of this ROD.

C. Evaluation of Alternatives

The original selected remedy, onsite capping and the amended remedy S/S, along with other alternatives evaluated in the FS are profiled against the nine criteria in Section 10 of this ROD.

D. Statutory Determinations

Considering the new information that has been developed and the changes that have been made to the selected remedy for OU #1, the EPA and NCDEHNR believe that the remedy remains protective of human health and the environment, complies with federal and state requirements, and is cost effective. In addition, the amended remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable for this Site.

XIII. STATUTORY DETERMINATIONS

Based upon available information, the selected remedy satisfies the remedy selection requirements under CERCLA, as amended by SARA, and the NCP. The remedy provides protection of public health and the environment, is cost-effective, utilizes permanent solutions to the maximum extent practicable, and satisfies the statutory preference for remedies involving treatment technologies.

Protection of Human Health and the Environment

The selected remedy will permanently treat the groundwater and soil and remove the potential risk associated with the contamination. Dermal, ingestion, and inhalation contact with Site contaminants would be eliminated.

Compliance with ARARs

The selected remedy will comply with all Federal and State ARARs. No waivers of State or Federal requirements are anticipated for this Site.

Cost Effectiveness

The selected groundwater and soil remediation technologies are more cost-effective than the other acceptable alternatives considered. The selected remedies provide greater benefit for the cost because they permanently treat the waste.

Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy represents the maximum extent to which permanent solutions and treatment can be practicably utilized for this action. Of the alternatives that are protective of human health and the environment and comply with ARARs, EPA and the State have determined that the selected remedy provides the best balance of trade-offs in terms of long-term effectiveness and permanence; reduction in toxicity, mobility, or volume achieved through treatment; short-term effectiveness, implementability, and cost; State and community acceptance, and the statutory preference for treatment as a principal element.

Preference for Treatment as a Principle Element

The preference for treatment is satisfied by the use of S/S on the soils and a series of treatment methodologies on the groundwater. The principal threats at the Site will be mitigated by use of these treatment technologies.

XIV. DOCUMENTATION OF SIGNIFICANT CHANGE

CERCLA Section 117(b) requires an explanation of any significant change from the preferred alternative presented in the Proposed Plan. In the Proposed Plan, Alternative 8 was chosen for soil remediation. This alternative consists of excavation and onsite treatment by solidification/stabilization, with offsite disposal of the treated material at an industrial landfill.

However, comments received during the 60-day public comment period, December 17, 1992 to February 18, 1993, overwhelming favored Alternative 7. This alternative is the same as Alternative 8, however, the treated material would be disposed of onsite instead of taken offsite.

This remedy, Alternative 7, is approximately $13 million less than Alternative 8. However, the basis for choosing Alternative 8 were: 1) EPA had received complaints from residents surrounding the MSR facility that the mound of soil currently onsite was unsightly (Onsite disposal would create a mound ten times as big as currently onsite); and 2) With offsite disposal, deed and land-use restrictions would not be needed. The properties could be used more extensively or developed without environmental restriction.

Residents and area citizens however, preferred onsite disposal instead of trucking approximately 7800 loads of treated material to an area landfill. Therefore, this remedy is in accord with the concern expressed during the comment period by the affected community.

APPENDIX B

STATE CONCURRENCE

State of North Carolina
Department of Environment, Health, and Natural Resources
512 North Salisbury Street @ Raleigh, North Carolina 27604

James B. Hunt, Jr., Governor

Division of Solid Waste Management
Telephone (919) 733-4996

Jonathan B. Howes, Secretary

March 12, 1993

Ms. Giezelle Bennett
Remedial Project Manager
US EPA Region IV
345 Courtland Street, NE
Atlanta, GA 30365

RE: State Concurrence with the Record of Decision
Bypass 601, Groundwater Contamination
NCD 044 440 303
Concord, Cabarrus County, NC

Dear Ms. Bennett:

The State of North Carolina has reviewed the Record of Decision for the Bypass 601 Site and concurs with the selected remedy, subject to the following conditions.

1. State concurrence on this Record of Decision and the selected remedy for the site is based solely on the information contained in the attached Record of Decision. Should the State receive new or additional information which significantly affects the conclusions or remedy selection contained in the Record of Decision, it may modify or withdraw this concurrence with written notice to EPA Region IV.

2. State concurrence on this Record of Decision in no way binds the State to concur in future decisions or commits the State to participate, financially or otherwise, in the clean up of the site. The State reserves the right to review, comment, and make independent assessment of all future work relating to this site.

3. The Presence of residual contamination in the Solidified/Stabilized waste will require deed recordation/restriction to document their presence and could limit future use of the property as specified in G.S. 130A-310.8.

The State of North Carolina appreciates the opportunity to comment on the Draft Record of Decision for the subject site, and we look forward to working with EPA on the final remedy.

Sincerely,

Jack Butler, PE
Environmental Engineering Supervisor
Superfund Section

cc: Randy McElveen, NC Superfund Section

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

MAR 24 1993

4WD-NSRB

Mr. Jack Butler, PE
Environmental Engineering Supervisor
Superfund Section
NCDEHNR
401 Oberlin Rd, Suite 150
Raleigh, NC 27605

RE: State Concurrence on the Bypass 601
Record of Decision

Dear Mr. Butler:

EPA Region IV appreciates the State's conditional concurrence on the Record of Decision (ROD) for the Bypass 601 Groundwater Contamination Site located in Concord, North Carolina. For the record, EPA would like to respond to the conditions formulated by the North Carolina Department of Environment, Health, and Natural Resources (NC DEHNR) - Superfund Section in the March 12, 1993 letter. Your letter, along with this response, will be included in Appendix B of the ROD. These letters should stand as official documentation that EPA and NCDEHNR have agreed on the preferred alternatives at this time.

Of the three conditions expressed (concurrence based on current information; concurrence exclusive of future work and land restrictions to be applied based on State law); only the third condition requires a response from the agency. In response, the State may in the future put in place, pursuant to State law (G.S. 130A-310.8), a deed recordation/restriction to document the presence of residual contamination which may limit the future use of the property.

Please give me a call at 404/347-7791 if you have any questions.

Sincerely,

Giezelle S. Bennett
Remedial Project Manager